UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 10/575,965 | 04/14/2006 | Naonori Shiina | MIY.001.0024.PC | 5098 |

58789 7590 09/02/2010

NDQ&M WATCHSTONE LLP
300 NEW JERSEY AVENUE, NW
FIFTH FLOOR
WASHINGTON, DC 20001

| EXAMINER | |
|---|---|
| SCHIFFMAN, BENJAMIN A | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 1791 | |

| MAIL DATE | DELIVERY MODE |
|---|---|
| 09/02/2010 | PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/575,965 | SHIINA ET AL. | |
| | Examiner | Art Unit | |
| | BENJAMIN SCHIFFMAN | 1791 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *02 July 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-29* is/are pending in the application.

4a) Of the above claim(s) *15-29* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14* is/are rejected.

7)☒ Claim(s) *1-14* is/are objected to.

8)☒ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 April 2006* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *06/21/2007 and 04/14/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Election/Restrictions*

1. Applicant's election without traverse of Group I, claims 1-14, in the reply filed on 02 July 2010 is acknowledged.

2. Claims 15-27 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected inventions, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 02 July 2010.

### *Drawings*

3. The drawings are objected to because they are of poor quality and the specification's references to the figures are unclear. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not

accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Objections***

4. Claims 1-14 are objected to because of the following informalities: the grammar and formatting of the claims is inconsistent with conventional practice. The claims should be redrafted to conform with the grammatical and formatting requirements specified in the MPEP **(see MPEP § 608.01(m) and 37 CFR § 1.75)**. Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claim 1, 6, 10, 12 and 14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

7. Claim 1, recites the limitation "storage elastic modulus thereof within a range from 1.6 to $3.0 \times 10^4$ Pa" which is indefinite for four reasons. First, it is unclear if the range is from 1.6 to $3.0 \times 10^4$ or from $1.6 \times 10^4$ to $3.0 \times 10^4$. Second, it is unclear whether the storage modulus is referring to the modulus of the entire foam/skin composite or just the polyolefin foam. Third, it is unclear what storage elastic modulus is measured the two possible moduli are the tensile storage modulus (E') and the shear storage modulus (G'). Finally, storage elastic modulus is highly

dependent on the conditions upon which the measurement is preformed, e.g. temperature and frequency. Merely claiming a preferred storage elastic modulus without also claiming the conditions of measurement or the type of moduli, renders the claim indefinite.

8. Claims 6, 10, 12 and 14 are rejected for their dependence on claims 1.

***Claim Rejections - 35 USC § 102***

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 2, 8, 9 and 11 rejected under 35 U.S.C. 102(b) as being anticipated by Shiina et al. (EP 0 698 464).

11. Regarding claim 2, Shiina discloses a process for producing a foam composite having a skin with an even thickness, a foamed body with homogeneous and fine bubbles, and plastic reinforcing members **(see title/abstract)**, wherein a mold is charged with a plastic powders and polyolefin pellets that are larger than the plastic powders, the pellets being covered in a portion or in the whole surface with plastic **(see col. 9 ll. 4-15)** and able to be cross-linked and foamed, the mold is heated from outside while being rotated at within a range from 1 to 2 rpm, so that a plastic skin is formed and the pellets adhere to the skin, and is heated further permitting that the polyolefin cross-links and the pellets expand by the decomposition of a foaming agent **(see col. 22 ll. 30 to col. 24 ll. 53)**.

12. Regarding claim 8, Shiina discloses that the quantity of the pellets is adjusted to control the shape and size of the hollow section **(see col. 8 ll. 14-30)**.

13. Regarding claim 9, Shiina discloses that plastic waste may be used in process **(see col. 10 ll. 1-18)**.

14. Regarding claim 11, Shiina discloses that high density polyethylene is coated on the polyolefin pellets **(see col. 22 l. 36)**.

### *Claim Rejections - 35 USC § 103*

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

16. The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

17. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out

the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

18. Claims 1, 6, 10, 12 and 14 rejected under 35 U.S.C. 103(a) as being unpatentable over Shiina (EP 0 698 464 A2) in view of Abe et al. (*Study on Foaming of Crosslinked Polyethylene*) and Almanza et al. (*The microestructure of polyethylene foams produced by a nitrogen solution process*).

19. Regarding claim 1, Shiina discloses a process for producing a foam composite having a skin with an even thickness and an integrated foamed body core, being the skin and the core bonded together **(see title/abstract)**, wherein a mold is charged with one of plastic powders and minute particles, and polyolefin pellets that can be cross-linked and foamed, being the pellets larger than the plastic powders and the minute particles, the mold is heated from outside while being rotated at within a range from 1 to 2 rpm, so that a plastic skin is formed and the pellets adhere to the skin, and the mold is heated further so that the polyolefin cross-links and the pellets expand by the decomposition of a foaming agent **(see col. 14 ll. 18-55)**.

20. Shiina does not appear to explicitly discloses crosslinking to a degree of storage elastic modulus within a range from 1.6 to $3.0 \times 10^4$ Pa.

21. However, Abe discloses a crosslinked polyolefin foam **(see abstract)** which exhibits decreasing storage modulus (G') with decreasing frequency measurement. Additionally, Abe discloses decreasing storage modulus with decreasing cross-linking density, i.e. level

crosslinking degree **(see p. 2151 col. 1 and Fig. 5)**. Further, the storage modulus of Abe is measure at 438 K (164.85 degrees Celsius).

22. Additionally, Bhatt discloses a crosslinked polyolefin foam **(see abstract)** wherein that measurements of the storage modulus decrease with increasing temperature.

23. Therefore, at the time of invention, it would have been *prima facie* obvious to one of ordinary skill in the art to measure the foam of Shiina at a modulus within the claimed range by measuring at a low frequency and high temperature. Furthermore, the storage modulus could be modified/optimized by increasing or decreasing the cross-linking density as discussed in Abe.

24. Regarding claim 6, Shiina discloses that the powder contains 1 PHR azodicarbon amide, a foaming agent **(see col. 22 ll. 44-45)**.

25. Regarding claim 10 , Shiina discloses that the wherein the plastic powders is high density polyethylene **(see col. 22 ll. 46)**.

26. Regarding claim 12, Shiina discloses adding a flame retardant **(see col. 11 ll. 8-15)**.

27. Regarding claim 14, Shiina discloses the powder is HDPE and contains 2 PHR organic peroxide **(see col. 18 ll. 13-14)**.

28. Alternatively claims 1, 6, 10, 12 and 14 rejected under 35 U.S.C. 103(a) as being unpatentable over Shiina et al. (EP 0 698 464 A2) in view of Shiina et al. (JP 2002-192548 A).

29. Regarding claim 1, Shiina (EP 0 698 464 A2) discloses a process for producing a foam composite having a skin with an even thickness and an integrated foamed body core, being the skin and the core bonded together **(see title/abstract)**, wherein a mold is charged with one of plastic powders and minute particles, and polyolefin pellets that can be cross-linked and foamed,

being the pellets larger than the plastic powders and the minute particles, the mold is heated from outside while being rotated at within a range from 1 to 2 rpm, so that a plastic skin is formed and the pellets adhere to the skin, and the mold is heated further so that the polyolefin cross-links and the pellets expand by the decomposition of a foaming agent **(see col. 14 ll. 18-55)**.

30. Shiina (EP 0 698 464 A2) does not appear to explicitly discloses crosslinking to a degree of storage elastic modulus within a range from 1.6 to $3.0 \times 10^4$ Pa.

31. However, Shiina (JP 2002-192548 A) discloses a similar process as disclosed above **(see title/abstract)** wherein a polyolefin material having a storage modulus of greater than $1 \times 10^4$ Pa and less than $1 \times 10^5$ Pa **(see ¶ 10, 11, 40)**.

32. At the time of invention, it would have been *prima facie* obvious to one of ordinary skill in the art to modify the storage modulus of Shiina (EP 0 698 464 A2) to include the modulus of Shiina (JP 2002-192548 A), because such properties are desirable in the final product and could be combined in a known method to yield predictable results.

33. Regarding claim 6, Shiina discloses that the powder contains 1 PHR azodicarbon amide, a foaming agent **(see col. 22 ll. 44-45)**.

34. Regarding claim 10 , Shiina discloses that the wherein the plastic powders is high density polyethylene **(see col. 22 ll. 46)**.

35. Regarding claim 12, Shiina discloses adding a flame retardant **(see col. 11 ll. 8-15)**.

36. Regarding claim 14, Shiina discloses the powder is HDPE and contains 2 PHR organic peroxide **(see col. 18 ll. 13-14)**.

37. Claims 3-5 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shiina et al. (EP 0 698 464 A2) in view of Shiina et al. (US 3,987,134)

38. Regarding claim 3 and 4, Shiina et al. (EP 0 698 464 A2) discloses a method a discussed in the 35 U.S.C. § 102(b) rejection of claim 2, above. Additionally, Shiina et al. (EP 0 698 464 A2) discloses that the polyolefin pellets are formed as a rod of polyolefin which is covered with plastic, compressed and cut **(see col. 9 ll. 4-15)**; and when foaming the pellets form even size granular foamed bodies with a covering of a reinforcing member with practically even thickness and are integrated, bonded mutually, filling in the core, and bonded to the skin **(see col. 22 l. 56 to col. 23 l. 15)**.

39. Shiina et al. (EP 0 698 464 A2) does not appear to expressly disclose that the edge section are bonded or the shape of the reinforcing members.

40. However, Shiina et al. (US 3,987,134) discloses a method of producing foamed articles in substantially the same manner as Shiina et al. (EP 0 698 464 A2), wherein the compression cutting seals the internal material **(see col. 3 ll. 62-68)**. Further Shiina et al. (US 3,987,134) discloses belt, string and solid shaped reinforcements intermingled with the foamed bodies **(see fig. 5-8)**.

41. At the time of invention, it would have been *prima facie* obvious to one of ordinary skill in the art to modify the method of Shiina et al. (EP 0 698 464 A2) to include the sealing of Shiina et al. (US 3,987,134), because this would allow for the formation of desirable shaped continuous internal reinforcements.

42. Regarding claim 5, Shiina (EP 0 698 464 A2) discloses a skin thickness of 0.5 to 10 mm **(see col. 7 ll. 38-40)**, a foam density of 0.1 to 0.01 g/cc **(see col. 9 l. 46 and col. 14 l. 47)** a

molded article thickness, i.e. diameter, of 1 to 100 mm **(see col. 7 ll. 6-7)**. Shiina (US 3,987,134) discloses reinforcement structure thickness of 0.3 to 10 mm **(see col. 3 ll. 34-36)**.

43. Regarding claim 7, Shiina (US 3,987,134) discloses that the plastic covering, i.e. the reinforcement forming portion, of the polyolefin pellets contains a foaming agent in an amount of 2 PHR **(see col. 4 ll. 40-44 and col. 8 l. 63 to col. 9 l. 30)**.

44. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shiina et al. (EP 0 698 464 A2) in view of Lammers (US 3,773,875)

45. Shiina does not appear to expressly disclose forming the foam to contain metal fittings strongly secured to the reinforcing members.

46. However, Lammers discloses a method of forming a foamed article **(see title/abstract)** in which metal fittings are embedded into the foamed body **(see abstract and col. 1 l. 71 to col. 2 l. 43)**

47. At the time of invention, it would have been *prima facie* obvious to one of ordinary skill in the art to modify the method of Shiina to include the metal fittings of Lammers, in order to allow for attachment means to be embedded securely within the foam article.

***Conclusion***

48. Any inquiry concerning this communication or earlier communications from the examiner should be directed to BENJAMIN SCHIFFMAN whose telephone number is (571) 270-7626. The examiner can normally be reached on Monday through Thursday from 9AM until 4PM.

49. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, CHRISTINA JOHNSON can be reached on 571-272-1176. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

50. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/BENJAMIN SCHIFFMAN/
Examiner, Art Unit 1791

/Christina Johnson/
Supervisory Patent Examiner, Art Unit 1791